REMARKS

Favorable reconsideration of this application, in view of the above amendment and the following remarks, is respectfully requested.

Claims 1-14, 16-20 and 22-26 are pending in this application. By this Amendment, Claim 1 is amended; and no claims are canceled or added herewith. It is respectfully submitted that no new matter is added by this Amendment.

In the outstanding Office Action, Claims 1-14 and 16-20 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,883,997 to Kim; and Claims 22-26 were rejected under 35 U.S.C. § 103(a) as unpatentable over Kim and further in view of "MPEG-4 and Rate-Distortion-Based-Shape Coding Techniques" to Katsaggelos.

The applied art does not teach or suggest associating each of the vertexes in each of the at least three frames with each of the same vertexes in an adjacent frame and obtaining trajectories, each of the trajectories linking the same vertexes through the at least three frames based on the time-series variation of the at least three frames, as claimed in Claim 1 and as similarly recited in the independent claims.

Instead, Kim teaches encoded data for the current contour based on either the intra-coded data or the inter-coded data. The inter-coded data is provided by coding the current contour with reference to the previous contour. The intra-coded data or the inter-coded data is selected based on the vertex displacements between respective previous vertices and their corresponding predicted vertices. To calculate the vertex displacements, each of the previous vertices is mapped onto the current contour to form thereon a predicted vertex corresponding to each of the previous vertices. Please see at least col. 2, lines 47-63 of Kim.

According to one or more embodiments of the invention, it is possible to approximate the size, shape, movement, deformation or the like, of a region of a desired object in a moving picture, as a polygon, with high precision and high speed. In addition, the region of

the desired object in the moving picture is described in a small amount of data, making it possible to object generation or data processing. Please see at least page 45, line 25 to page 46, line 8 of the present specification.

The Office Action asserts that Kim discloses associating each of the vertexes in each of the frames with each of the same vertexes in an adjacent frame (i.e., mapping the vertices) (col. 4, lines 6-15). However, Kim merely teaches a vertex mapping between the current contour and the predicted contour. The motion compensated vertices A to E are mapped to the predicted vertexes A' to E'. The motion compensated vertices A to E and the predicted vertexes A' to E' are included in two frames. Thus, Kim does not teach associating each of the vertexes in each of the at least three frames with each of the same vertexes in an adjacent frame.

Further, Kim does not teach obtaining trajectories, each of the trajectories linking the same vertexes through the frames based on the time-series variation of the frames. A vertex mapping process of Kim does not obtain the trajectories, each of the trajectories linking the same vertexes through the at least three frames based on the time-series variation of the at least three frames.

The Office Action asserts that Kim discloses generating a polygon approximating a contour of the object region in each of the frames, the polygon having vertexes (cols. 5-6, lines 64-5; col. 6, lines 48-60). However, Kim merely teaches that each primary contour segment in the inter-mode represents a portion of the current contour connecting two adjacent predicted vertices and contour pixels disposed there between and is approximated by a primary line segment joining the two adjacent predicted vertexes. Kim does not generate the object region data comprising an approximate function data expressing the trajectories.

Even if Kim relates to an encoder processing the input video image on a VOP-by-VOP basis, i.e., an object-by-object basis (col. 1, lines 44-55), Kim does not teach linking the

same vertexes through the at least three frames based on the time-series variation of the at least three frames.

An object of one or more exemplary embodiments of the invention is to represent object region data in a moving picture in any shape and express data on object position, size, and shape precisely. In order to realize the above, the object is approximated in a polygonal shape. If a time-series variation of an object is expressed by polygon approximation, the movement of each vertex that is polygon approximated is described. However, in order to serially record a position of the vertex of each frame, there is a problem that a large amount of data is required, which is inconvenient. Please see the discussion in the background section of the present invention at page 2, line 12 to page 4, line 21.

Therefore, according to one or more embodiments of the present invention, the vertex association unit associates corresponding vertexes of approximation polygons between adjacent frames in a linking manner with regard to the vertexes of approximation polygons generated over a plurality of frames with regard to each object, and generates a trajectory of the vertexes of the approximation polygons over a plurality of frames with regard to each object.

As an example of the invention, when a vertex of an approximation polygon in which a region of an object in a frame is approximated is associated with a vertex of the corresponding polygon of the adjacent frame, thereby obtaining a trajectory of the vertex, a distance between the vertex in one frame and the associated vertex of the adjacent frame may be determined so as to be minimum. Before obtaining this distance, two polygons may be aligned with each other so that their centers of gravity coincide with each other. In addition, for example, a position of a vertex of the adjacent frame is estimated from a trajectory of the already associated vertex so that a distance between the estimated vertex and a vertex in the adjacent frame may be determined so as to be minimum. Further, for example, the

characteristic quantity in vertexes of a polygon is calculated so that a vertex having its closest characteristic quantity in the adjacent frame may be associated with another vertex. Please see at least page 15, line 10 to page 16, line 13.

As noted above, Kim fails to disclose or suggest the features of the independent claims. Because Katsaggelos is not relied upon to provide the features identified as deficient in Kim discussed above, it is not substantially addressed herewith. Accordingly, withdrawal of the rejection of the claims under 35 U.S.C. § 103(a) is respectfully requested.

Consequently, for the reasons discussed in detail above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

Respectfully submitted,

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